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AUTHOR Hellermann, John; Cole, KimMarie; Zuengler, Jane
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ABSTRACT

One especially productive avenue of research is the close analysis of classroom talk. In the micro-ethnographic approach used in this study, conversation is not simply a metaphor, but becomes the unit of analysis. For the study, one key element to the functioning of thinking communities is the way they are co-constructed by participants. While all the talk that occurs in any given classroom is potentially relevant to some aspect of learning and achievement, it is the discussion of the subject matter--the content--that can provide crucial insights into the kinds of learning and achievement that are valued and made available in schools. This paper focuses on the subset of data involving exchanges coded by the field team in the classroom as subject matter exchanges; data are drawn from a 5-year longitudinal study of language use in linguistically and culturally diverse subject matter classrooms. The paper explains that, during data collection, research teams of two people were in each classroom, with two video cameras; team members also took observational field notes during classes, and periodically interviewed teachers and students. It notes that the dominant pattern for classroom discourse is teacher-centered, but classroom discourse research has begun to acknowledge student-initiated discourse. The paper finds that, after reviewing the discourse in two high school science classrooms in some detail, the observation is that learning and achievement is accomplished by the construction of thinking communities through quite different discourse practices. It notes some issues relevant to the co-construction of classroom discourse practices across the two classrooms. (Contains 23 references.) (NKA)

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JOHN HELLERMANN
KIMMARIE COLE
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JOHN HELLERMANN
KIMMARIE COLE
JANE ZUENGLER

National Research Center on English Learning & Achievement
University at Albany
State University of New York
1400 Washington Avenue, Albany, New York 12222

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National Research Center on English Learning & Achievement
University at Albany, School of Education, B-9
1400 Washington Avenue, Albany, NY 12222
http://cela.albany.edu/
518-442-5026

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INTRODUCTION

In a climate of interest and concern about public education, researchers are finding new tools and turning in different directions in their investigations of classroom behavior. One especially productive avenue is the close analysis of classroom talk. Studies in this area have yielded important findings about the moment-by-moment construction of classroom communities through talk (among them Mehan, 1979; Erickson, 1982; McDermott & Tylbor, 1983; Mahnke, 1997). From these approaches and analytic frameworks, applied linguists and educators are able to identify ways that talk is used by teachers and students to establish meaningful social practices of classrooms. In these social practices, educational phenomena like concept development and learning and educational achievement unfold, are made visible or invisible, and are foregrounded by classroom participants, with important consequences for individual students and for entire classes. In these respects, we can talk about learning and achievement in schools as products of ongoing conversations.

In the micro-ethnographic approach used in the current study, conversation is not simply a metaphor, but becomes the unit of analysis. Meaningful classroom conversations are more than the content of the words used by teachers and students. The structure of the utterances, their order in the flow of talk, and how participants are recognized and responded to all influence how conversations proceed and how they function to provide learning opportunities for students. These conversational practices are not static or uni-directional. Nor do classroom conversations occur randomly. Patterns of interaction evolve over time, with the cooperation and participation of the interactants. By looking closely at these patterns and the practices that emerge from them, we are able to see the kinds of 'thinking communities' that develop in different classrooms. From the language socialization (Ochs, 1988; Schieffelin & Ochs, 1986) perspective that informs our

project, it is the close analyses of social practices that show the ways that novices to a community adopt the values, attitudes and beliefs of that group through interaction with more experienced members. Gee and Green (1998) also define learning as the outcome of interactions when they say, ". . . learning [is] changing patterns of participation in specific social practices within communities of practice" (p. 147).

These socio-cultural perspectives suggest that classroom participation practices result from students and teachers negotiating their places within both social and subject-matter discourses based on their existing social, literacy, and subject-matter knowledge. The resulting practices sometimes result in what CELA researchers have called 'thinking communities' – environments conducive to and supportive of high levels of learning and achievement. In such settings students and teachers are supported and challenged by one another to accomplish the social and subject-matter interactions that constitute schools. Other times, classroom practices result in interactions that do not support students' thinking and learning together.

For our study, one key element to the functioning of thinking communities is the way that they are co-constructed by participants. Certainly in schools, there are many prior models for teachers and students to use, and we do not suggest that each class begins from 'ground zero.' We do propose, however, that local communities make different use of the interactional resources they have available in ongoing and meaningful ways, and that different types of thinking communities are an outcome of these practices.

While all the talk that occurs in any given classroom is potentially relevant to some aspect of learning and achievement, it is the discussions of the subject matter – the content – that can provide crucial insights into the kinds of learning and achievement that are valued and made available in schools. Quite early in our series of classroom observations, it became clear to our research team that different types of talk happened. We began noting the function or functions it filled in the classroom and devised a classification system of exchanges. An exchange is a series of at least two verbal turns by people in the classroom, where the type of talk can be indexed across the exchange. Exchanges are coded as Administrative, Achievement, Learning Strategies, Subject Matter, and/or Provisionally Other (miscellaneous). Multiple coding is quite common since classroom talk is conducting multiple functions throughout the course of any class period, depending on the type of activity happening in the class.

The focus of this paper is on the subset of data involving exchanges coded by the field team in the classroom as subject matter exchanges (SMEs). Some of them may be multiply coded, but there is a strong emphasis on the subject matter (science) in the talk. These SMEs provide us with an excellent opportunity to study closely the ongoing development of knowledge from action in classrooms. By examining the ways that participation is structured around these subject matter exchanges, we are able to show the development of, and socialization to, two distinct participation structures – one that emphasizes channeling knowledge through the teacher/expert; the other, which positions all class members as potential recipients for questions and knowledge building. Rather than making claims about the relative usefulness of either of these models, we will offer some comparisons about the kind of science learning that is foregrounded by each.

Data

The data for this study are drawn from a five year longitudinal study of language use in linguistically and culturally diverse subject matter classrooms. Jefferson High School is located on the south side of Center City, a large urban city in the Midwest.[1] The student body at Jefferson High is 60% Hispanic, 20% African American, 10% White, 8% Asian, and 2% Native American.[2] During the course of data collection, research teams of two people were in each classroom, with two video cameras. This decision to use 2 cameras and 2 observers was made to best capture the range of interactions we observed. (See Zuengler, Ford, & Fassnacht, 1999 for a complete description of this method of filming.) Additionally, research team members took observational field notes during classes, and periodically teachers and students were interviewed. All of these sources of data have been used to build the following analyses of the role of participant design, or recipiency, and the development of thinking communities.

Two Types of Conversations in the Classroom: Who Talks and to Whom?

The dominant pattern for classroom discourse that we observed is teacher-centered and rooted in the three-part IRE/IRF format (Sinclair & Coulthard, 1975; Mehan, 1979; Van Lier, 1988). In such a discourse pattern, the teacher is typically situated at the front of the classroom with the students seated at their desks. The teacher leads the discourse by asking questions of

students, and students answer the questions in an order in which typically one student speaks at a time and answers the teacher's question very briefly, often in a one word response.

Classroom discourse research has begun to acknowledge that student-initiated discourse, which does not follow the rigid three-part IRE format, can and does occur in the classroom (Erickson, 1982; Cazden, 1988; Van Lier, 1988). This research is beginning to shed new light on the traditional views that because of teachers' and students' shared cultural knowledge of the asymmetrical power relationships in school, such student-directed exchanges are non-existent (McHoul, 1978; Sinclair & Brazil, 1982). Our observation has discovered that while student-led subject matter discussions involving the full class are rare, they do occur. There are several reasons for their rarity. First, as other researchers have discussed, teachers are recognized institutionally as the leaders of the classroom and have the institutional authority as subject experts, giving them special status as leaders of classroom discourse. Second, unlike other proxemic relationships in the classroom that facilitate student-student exchanges (e.g., the science lab or small-group discussion), in the full classroom arrangement, students are most often facing the same direction and are the visual focus of the teacher at most times.

Finally, few teachers are willing or able to risk the loss of control that can result from a student-led, full class subject-matter exchange, unless a particular student is designated to take the 'teacher' role for a limited time as part of a particular assignment. Because of the predominance of teacher-centered classroom discourse, it is interesting and important to question both in what ways the teacher-centered discourse is accomplished and why and how other formats for classroom discourse practices can occur. The following discussion will compare the teacher-led discourse format with student-student subject matter exchanges in order to discover how the two formats for classroom discourse are accomplished locally and established as classroom practice from which communities for thinking are established.

Recipiency in Talk: Establishing Talking Partners

When students do play a greater role in subject-matter exchanges during a full-class setting, the circumstances that allow such exchanges to occur reveal important aspects about participation in classroom discourse as it relates to learning and achievement. After years of observation and close analysis of classroom discourse, we have noticed that active participation

in subject-matter exchanges and the development of effective thinking communities revolves around a complex interactional phenomenon – constructing "recipients" for subject-matter exchanges in the classroom. Viewing the classroom and classroom discourse as dynamic social situations in which learning and achievement are accomplished in large part through language, this paper looks closely at the sequence of turns in classroom discourse as one path to the discovery of how different types of classroom discourse practices develop. Subsequently, we can see how these practices facilitate the creation of knowledge through the action of talk as well as environments for the development of thinking communities in the classroom.

Our research seeks to add to the growing body of work that sees classroom discourse participation as more than simply the dyadic categories of speaker-hearer or teacher-student. We see the participants in the classroom as regularly negotiating their places, and the places of others, within the classroom discourse. Part of this negotiating involves how, to whom, and about what one participant talks to another. As participants do in everyday conversation, students and teachers must always make clear who it is they are addressing – their recipients. In the classroom this task can be done when the teacher addresses a student by name and asks that student a question about something the class has been working on. In an example like this, the teacher has designed her utterance for the particular student by using the student's name and by asking a question within the realm of the immediate context of subject-matter for the particular classroom. Students, too, make sure to show whom they see as their conversational partners. When a student waves an arm or says "teacher, teacher," that is an indicator that the teacher is the planned recipient for the talk to come. These examples are quite direct, but there are other, more subtle ways that recipient design is accomplished in classrooms, and we discuss some of those in our examples below. By exploring how "recipient design" (Sacks, 1992) is accomplished in classroom talk, how the participants co-construct one another as relevant recipients for subject-matter exchanges, we can come to a better understanding of how thinking communities are developed. We see the degree of participation in and recipiency for subject-matter exchanges in the classroom as fluid, shifting over the course of a class period, a semester, a school year, and a multi-year school career. Our work builds on findings that have shown how participants are continually negotiating their status of expert and novice within one encounter (Schegloff, 1989) and within a physics laboratory session (Jacoby & Gonzales, 1991). We view the classroom as a place where students and teacher must continually negotiate their places as "experts" and

"novices", as recipients/non-recipients, and where the institutional nature of classroom discourse (repetitive, goal driven; Drew & Heritage, 1992) allows classroom discourse practices to develop over time.

Co-constructing the Teacher as Sole Recipient

The first type of classroom discourse community that this paper highlights is one in which the teacher has been co-constructed as the sole recipient for student-initiated subject-matter exchanges (SMEs). While observing a November review session in a 10th grade chemistry class we noted something striking about the discourse patterns. We saw that while the students were speaking to one another about non-subject matter issues, they seemed not to be participating in student-student SMEs. Not only did they not participate in student-student and other student-initiated SMEs, often the students were speaking so loudly with one another that they could not hear SMEs generated by their peers. During the SMEs and non subject-matter talk, students continued completing the task assigned them (filling in a review sheet), and by the end of the class period, the outcome appeared to be one in which students had successfully completed the task for the day. This left us to wonder what kind of thinking community was available to students in a class where the students do not seem to be primary recipients for their peers' subject-matter exchanges.

The subsequent analysis of the subject-matter exchanges in this particular class led us to ask the question: What are the practices that lead up to this type of mono-recipiency being the dominant discourse of the classroom? We believe that saying simply that the classroom was "too loud" or "unfocussed" does not lead in any way to the discovery of how learning is done in classrooms. To answer our question, we saw a need to return to data from the beginning of the semester to uncover how teacher and students had co-constructed the recipients for subject-matter exchanges and, subsequently, developed patterns of classroom discourse practices that had become the dominant discourse practices for the classroom. In this way, we hoped to discover the different discourse practices within which communities of thinking are established in classrooms. The first part of the discussion below looks in detail at the structural elements of the language used by a teacher and students to negotiate a practice in which students do not see themselves as accountable to the subject-matter exchanges of their peers.

Early Days: Establishing a Single Recipiency in the Classroom

After one year of classroom observation and a close examination of the classroom discourse on video tape, we are able to highlight four practices that Ms. Campbell and her 10th grade chemistry students engage in to negotiate a classroom discourse practice in which students are not active recipients in subject-matter exchanges.

Pronoun Indexcality. The first such practice is found in the structure of the language itself, particularly choice of pronoun. While pronouns index referential meaning (pronouns indicate the literal meaning of a proposition in which they are used), they also indicate some aspect of the context in which a proposition is uttered. For example, the use of "I" or "you" indicates that the referents are in some way "present" (Ochs, 1988). Wortham (1996) includes personal pronouns in the class of words he calls "shifters" (p. 332), a term that indicates these pronouns' role in constructing relationships between participants. Wortham notes the interactional significance of indicating relationships between the participants and that pronoun choice is one of the main linguistic tools that speakers have for indicating such relationships. The speaker's choice of pronoun use indicates how the speaker is choosing to frame the recipients' relationships to both herself and to the topic she is addressing. The speaker's choice of pronoun use indicates, in some way, who is relevant, who is "present." The teacher's choice of "I" vs. "we" vs. "you" indicates who the teacher is including or excluding from a relevant participant or recipient for the topic being addressed.

While a teacher's choice of pronoun is to a large degree below the level of consciousness, this recurring choice that teachers make has effects on the classroom discourse practices as a whole and can play a role in establishing thinking communities in the classroom. We noticed that Ms. Campbell's use of pronouns often works to exclude the students as relevant participants in the knowledge community of the classroom. For example, in the transcript excerpts in examples 1 through 3 (below) she uses the first person singular "I" for introducing conceptual information. The choice of the pronoun "I" not only refers to the speaker as the subject of the proposition, it contextualizes the proposition. The teacher's use of "I" with the introduction of conceptual information contextualizes the teacher as "knower." In the examples that follow we've used bold type to highlight the teacher's pronouns. An explanation of other transcript conventions used can be found on page 30.

Example 1:

teacher: **I** want to give you an overview?
Ramon: Um, hold on.
Adrianne: SHUSH.
Yolanda: °You guys, shush.°
teacher: **I** want to give you an overview of what the test is? that that ought to help you tremendously.
(5) ((something falls off a desk))
Pauline: down there, huh.
teacher: **I** also **I** also have=

Example 2:

teacher: okay. shh. mouths shut, eyeballs up front. (6) okay. (.) two aspects of chemistry, matter and energy? right now **I'm** focusing on energy? (.) and remember that when **we** change any anything (.) by hocus pocus in chemistry (.) if **I** react two substances together, there's always going to be a (.) or given off. So (.) for a:ll (2) chemical (2) reactions, (4) energy (2) is abso:rbed? (2) or (.) emitted what's another word for emitted.

Example 3:

teacher: ...to do right now is take a look **I** want **I** want to see your classification abilities okay **I'm** going to put do:wn eight different things and **I** want you to try to tell **me** if you could cla:ssify this information in two separate categories...

The speaker's use of the third person plural pronoun "we" and the second person plural pronoun "you" frame the discourse in a different manner. "We" not only indexes the speaker and addressees as referents, it also contextualizes the referents as relevant participants in the topic of discussion. While teachers can use "we" to include students as relevant participants in the classroom discourse, they may also use it to co-implicate students for objectionable subject-matter or behavioral classroom practices. In Ms. Campbell's classroom we noticed that often, the choice of "we" was made when the teacher wanted students to change their thinking, or their behavior (see examples 4 and 5 below). The use of "we" became a form for correction and discipline more than a discoursal resource for treating students as active participants in a "knowledge community." The second person plural "you" can be used to exclude the speaker as relevant to the topic by contextualizing the addressees as separate from the speaker. In example 6 below, the referents ("you") are the students who are contextualized as solely responsible for the receipt and recording of information.

Example 4:

Shavonne:	(she's) ready to go:, shut u::p.
teacher:	it should not take **us** 5 minutes to get into the class. because it's time wasted and **we** have a lot to do. (2) what **we** need to do right now

Example 5: beginning of class

teacher:	so **I my** main focus will be on the current chapter. the current material we're talking about. but **I**'m always going to try to bring up something that **we** dealt with in the past that maybe people **we**'re kind of shaky on. and **we** kept going over it and covering it again. trying to refresh **our** ideas in our our mind. **I** want to bring that up (.) so that (.) you know you don't you don't

Example 6:

Maggie:	AH
Miguel:	=should we take notes? (3) hey, should we take notes?
teacher:	uh, it's up to **you**. remember, **you**'re adult enough now, you decide where the voids are.
Vanessa:	can you get that (x) from under your desk.
Maggie:	under your what?
Vanessa:	under your chair.
teacher:	for tomorrow.
Craig:	is it on all this stuff (from our notes)?
teacher:	uh, the notes (2) **you** will use for **your**self, **I'm** just interested in the assignments that **I** gave out as assignments.

Ms. Campbell's use of the first and second person pronouns (highlighted in examples 1-6 above) show ways in which she works to frame recipiency in the classroom. Her pronoun choices, the use of "I" for the introduction of new scientific topics, and "we" and "you" for indicating student shortcomings and sole student responsibility for doing tasks reflect and work to create an environment in which learning is more an individual than a communal activity. Pronoun choice is evidence from a micro-level linguistic analysis that shows a way in which the students in this class are not being co-constructed as recipients for subject-matter exchanges and one way in which a more individual type of thinking community is established.

IRE Evaluation Component. Another structural issue of the language used to negotiate subject-matter presentation by students and teacher is format for the ubiquitous IRE sequence. One repeated exchange type where students and teacher negotiate the teacher as sole recipient for subject-matter exchanges comes out of the third part of this sequence (the teacher's "evaluation"

of a student "response"). In this class, it was notable that this part of the sequence is often quite extended. Students waiting for a response to their questions during an extended evaluation part of the sequence would become disengaged from the exchange. In focus group interviews (example 7, below), students commented on their frustration with Ms. Campbell's extended explanations.

Example 7:

Sandra:	…so she'll explain something, like she'll get, so like get carried away? Like if you ask her a question, she'll like explain the whole question and more and then behind and then after?
Arnold:	Yeah so yeah we kinda know it already and we just kinda get lost by the listening to her cause she just so we wanna start talking again.
…	
Ramon:	=[It's like
John:	=[Yeah, because she's like she just take a simple yes and no question and turn it into like an essay.
Arnold:	A- an- an hour
John:	Yeah, she's like
Interviewer:	Because she wants you to under[stand.
John:	[Yeah. Yeah.
Ramon:	(But she)
John:	Thing is that we get bored and then we understand absolutely nothing
Ramon:	Just lost

In this brief excerpt from interviews at the end of the semester, it is clear that students felt that the teacher's explanations were lengthy to the point where they were confused by the explanations and then, simply lost. In addition to their losing track of the content, one student suggests that he and his classmates want to talk, and our observations show that often they did, but not about the subject matter.

Lexical style. A more subtle issue in the establishment of recipiency for subject-matter exchanges is the teacher's choice of lexical items in creating a linguistic style that may have contributed to this lack of mutual recipiency between the students and teacher. In an attempt to address the students in their own age-appropriate variety of English (a variety we might call "teen English"), the teacher often used slang; but rather than using expressions from current popular culture or relevant urban terms, she drew on words and phrases, which, it seems, evoked her own teen years or were addressed to a younger audience than her current students. Along with the slang, the teacher attempted to use examples culturally relevant to the students.

However, she often used these examples in inappropriate contexts. The examples of language we are highlighting in the following examples are in bold type.

In example 8, the teacher refers to the atomic structure of a particular element as being a "happy camper" (lines 1, 3, and 4), meaning, the atomic structure is neutral with respect to electronic charge. The students respond to this usage in an almost mocking tone (lines 2, 4), hearing the language as perhaps too juvenile to be used when addressing high school sophomores, and laugh at the terminology (line 6). The teacher herself orients to this student derision in line 7.

Example 8:

1	Teacher:	now we have sodium as a **happy camper**. why?
2	?FS:	because it's like **big brother neon**?
3	Teacher:	we have flourine that's like a **happy camper** because it's like its big
4		brother neon, °ok°, but they're all **happy campers**, hang on
5	Melissa:	where's **big brother krypton**.
6	Ss:	((laugh))
7	teacher:	you gu:ys, settle do:wn,

In example 9, the teacher uses the attention-getting interjection, "yo", borrowed from a variety of English other than that which she speaks. Again, students question her use of that term (line 2) and then mimic her usage of the term (lines 4, 5, 7). We see the teacher's orientation to this mimicking in lines 8-9 when she comments to the students about her having to talk so loudly to get the students' attention.

Example 9:

1	teacher:	remember that, if we don't understand something? (.) **yo**.
2	Vanessa:	[**yo**?
3	Ss:	[((laughing))
4	Maggie:	**yo**.
5	Daniel:	**yo**.
6	teacher:	if we don't under[stand something
7	Maggie:	[**yo**.
8	teacher:	I'm not going to get through the day. my voice is just ((rubbing her
9		throat))

Examples 10 and 11 show several more examples of the teacher's use of dated language.

Example 10:

teacher:	they're switching partners aren't they. in this case we have a **partner switcherino** going on too, ok, we have a part [ner **switcherino** going on,
Craig:	[°**partner switcherino**°
Olga:	((laughing))
	(3)
teacher:	where [the chlorine is switching up with the sodium and that's giving
Craig:	[**partner switcherino**
teacher:	us this,
Craig:	°**switcherino**°
teacher:	and then we have the hydrogen and the hydrogen carbonate

Example 11:

teacher:	and you had a full cla:ss period to work on that.=
Shavonne:	=and you explained it.
	(.)
?MS:	hu [h?
teacher:	[okay. so don't **put me on the hot spot** [here (xxxxxxxxxxxxx)
Shavonne:	[I wasn't I (xxxxxxx).
	(.)
?MS:	pop. ((a high pitched popping noise))
teacher:	extra credit.
?FS:	so?

Ms. Campbell's awkward use of culturally relevant language ("yo") and archaic slang ("happy camper," "switcherino," "the hot spot") shows an attempt to create a rapport with students. Its effect, unfortunately, was to alienate her from the students in her class who often didn't know what her language meant. In these examples we see evidence of students imitating the teacher or commenting on her use of this type of language. At several points, in just a few turns after her use of this more informal language, Ms. Campbell asks for quiet or makes a bid to re-establish classroom control (examples 8 and 9). Rather than hearing her talk as relevant to their subject matter development, the student focus on the form of her talk works to create a tension in the classroom. The recipient design of the teacher's talk in this classroom was for a group of people she saw as "students" and she addressed this group of "students" using cultural references and word choice that she thought appropriate. To the students and the classroom observers, however, it appeared that the teacher was designing her talk to recipients other than the students actually present in the class. Wortham (2000) talks about teachers' strategic creations of prototypical students and classes as a way to conduct class, but here we see the unfortunate result of an "inaccurate" design.

Pedagogical Style. A final point to highlight from the beginning of the semester in the establishment of a classroom discourse practice is Ms. Campbell's pedagogical philosophy. Her stated philosophy of teaching and assumptions about students' self-motivation contributed to a classroom environment in which students were not co-constructed as recipients of other students' subject-matter talk. She stated to the class and reported to us in interviews that she wanted students to take responsibility for motivating themselves to learn and to discipline themselves in the classroom. While she occasionally lectured to the students about the need for self-discipline, she did not have consequences for students who engaged in off topic talk and did not hold students responsible for attending to one-another's subject-matter talk, primarily because she did not see this as part of her role, not because she couldn't do it.

An exchange from early in the semester (example 12) shows the students and teacher negotiating classroom management. In this exchange, the teacher advocates self-monitoring (lines 15-16 ". . . I am not going to if I see disruptive behavior I am not going to say anything") while the students advocate a more confrontational approach by the teacher. Adrianne says in line 7, "you need to take further action."

Example 12:

1	Adrianne:	(.) so if you don't say nothing you you can't expect them to not bring it
2		because (.) you know,(.) they are going to keep doing it anyway. so if
3		you let them allow it (.) then you could- shouldn't complain because you
4		(.) allow it.
5	teacher:	okay, let's back up a little bit, (.) okay? I I right now I'm not
6		allowing it
7	Adrianne:	oh, okay. (2) so you need to take further action [because saying it's not
8		allowed isn't going to work
9	teacher:	[that's right. okay.
10		hang on, now hang on. what what I'm saying here though is that (2) when
11		you engage me (3) in challenging your behavior that takes time from
12		cla:ss.
13	Adrianne:	true.
14	teacher:	true. And that in itself is a disruption. (.) so bottom line right here
15		what I am going to do (2) I am not going to >if I see disruptive
16		behavior< I am not going to say anything because that gets me in a in an
17		argumentative situation with the person?
18	Adrianne:	um hm?

Ms. Campbell also reported in interviews that she did not want to address issues of classroom management during her class because it took away from the business of doing science. And after the semester was over, she expressed some regret over her lack of confrontation. She also told us

of the dissatisfaction with the teacher-centeredness of her teaching style. Excerpts from interviews will illustrate this point.

On students' responsibility and teacher's role:

Campbell: . . . if I play up to this, if I play up to this [student behavior problem], I am really going to be reinforcing, so maybe it's **just best if I, just be myself** and just try to work. **Kind of ignore that behavior.** I don't know. . . . I suppose at one point **I could have challenged her** and asked her "what's the problem?" . . .

I think that my role is trying to get them to see that **this is more of a cooperative endeavor**, and that .I'm not working against them, I'm not the- I'm not the bad person trying to fail them, but I'm the person that's trying to make them successful in their study. . . .

I like to feel that **I'm a learning expediter that I look upon learning experience as a cooperative venture** and, when I first had this class at the very beginning, I felt as though I was pretty much being challenged all the time. And it wasn't—it wasn't a mutual endeavor, it was a matter of the students seeing them as apart from me, okay? And always challenging me because they—**I guess they assumed that my authority got in the way** or something like that. And . . . I enjoy working with people. I enjoy the learning process myself. **But I do—I do kind of anticipate some kind of anticipate some respect on their parts which I did not see.** . . .

So, what I was saying is **getting the kids to think about their own thinking and I—I believe that that's where they start taking charge of their lives**.

On her teaching style:

Campbell: AND I, I FEEL FRUSTRATED this year because I don't think I have packaged my themes in a very interesting. I have sort of, **I've sort of fallen back on the way that I have been taught in basically cog- concept**. I tried to Socratic method and things like that. Basically **the way I have approached this very, very traditional and it has frustrated me because I wanted to kind of try different things** and branch out, but unfortunately, you know, I, I just felt too much of, um, being pulled in different directions that I couldn't, I couldn't do that.

In an example from early in the semester (example 13 from the third week of class) we see an example of how Ms. Campbell's non-confrontational attitude towards student classroom activity helps to co-construct students as non-recipients of subject-matter exchanges. In the following excerpt from the classroom discourse, we see the teacher, at the beginning of the class, putting some chemistry terminology on the board (lines 8-29). Because she needs to go to attend to a student who needs to make up some work, she assigns the students the task of working together (lines 37-41) to come up with solutions to problems she has presented on the board.

Example 13:

8	teacher:	because it's time wasted and we have a lot to do. (2)what we need
9		to do right now is take a look I want I want to see your
10		classification abilities okay I'm going to put do:wn eight
11		different things and I want you to try to tell me if you could
12		cla:ssify this information in two separate categories (.) and
13		what the basis for the classification would be:. (.) so here we
14		go:,
...		
17		okay take a look at this. uh, first data, I have down the
18		solution and the test tube is red. (3) hang on Maggie, I haven't
19		forgotten about you. number two, he has a fever. don't, you
20		know, just think about this. number thre:e, his temperature is
21		102 degrees Farenheit. (.) number fo:ur, it's heavy. (2) number
22		fi:ve, the density is (.) 1.79 grams per cubic centimeter. (.)
23		number si:x, the object has a mass of 22.4 grams. (.) number
24		se:ven, the rock sample is friable?
25	?MS:	((Laughs))
26	?FS:	°wha:t?°
27	teacher:	the rock sample is friable. number ei:ght, >it's supposed to be
28		the< pressure is 760 millimeters of mercury
...		
37	teacher:	while you're thinking about that, and you can talk about it among
38		yourselves I got to set some people up in the back to do makeup
39		tests. I'm going to come back and I'm going to ask you for your
40		ideas, okay? (2) what I'm requesting is that you keep a low (.)
41		murmur, okay? you talk among yourselves in the immediate areas?
	((the teacher goes to the side of the room to administer a test to a student))	

Although the teacher made the assignment to work cooperatively towards generating solutions to the problems on the board, when she moves to the side of the classroom to get a student started on a make-up test (example 14), the students begin conversations about several topics, but do not discuss the problems from the board (lines 48-106).

Example 14:

48	Adrianne:	((singing)) (x) never found me (x)
49	?FS:	like that commercial that goes (x)
50	?FS:	ewe.
51	Shavonne:	I don't think that's what it wa:s.
52	Adrianne:	sixty-five years ago. (6) (x seems like it) (3) see?
53		(10)
54	Pauline:	go and talk to (x)
55	Yolanda:	hmm?
56	Pauline:	go and talk to (x)
57	Yolanda:	(xx) (2) they told me (x)
58	Olga:	it helps that (xx)
59	Yolanda:	she talks with me

60	Pauline:	why don't you go talk like I said
61	Yolanda:	talks with me
62	Pauline:	like I said, go and talk to(x)
((38 more lines about this and other topics))		
101	teacher:	okay. ((teacher comes back to the board))
102	Yolanda:	they took the flu shot (2) and they took it out I was like >is it
103		bleeding is it bleeding?< and the doctor said no and then the blood
104		[started (xx)
105	teacher:	[eyeballs
106	Yolanda:	and my and my face was-((pretends to faint))
107	teacher:	time out? eyeballs up front? (2) okay what did you come up with here.
108		what was some way that you could separate these into two categories. (4)
109		ye:ah, Melissa.
110	Melissa:	weight and (.) weight and temperature?

The extended example (above) shows a lack of subject-matter talk by students to accomplish the task that the teacher had assigned. Students are not constructing themselves as recipients for subject-matter exchanges. Instead, they take the time to discuss issues other than chemistry. During this time, the teacher also does not work to negotiate a role for students as recipients of subject-matter exchanges. While working with another student at the side of the classroom, and when she returns to the front of the class, Ms. Campbell does not comment on students' lack of subject-matter discussion. In this example, the teacher and students work to establish the classroom as a place where student-student subject matter exchange need not be done.

The four issues highlighted in this section:

1) distance between teacher and students regarding subject-matter material,

2) the teacher's long explanations to student questions,

3) the misconnection due in part to the teacher's linguistic style choices, and

4) the mismatch between the teacher's pedagogical philosophy and the students' expectations

show how a classroom discourse practice is established. This classroom discourse practice, in which students have not been co-constructed as active recipients for subject-matter exchanges, has a profound impact on how subject-matter exchanges are enacted throughout the rest of the semester, and subsequently, what kind of communities for thinking are established.

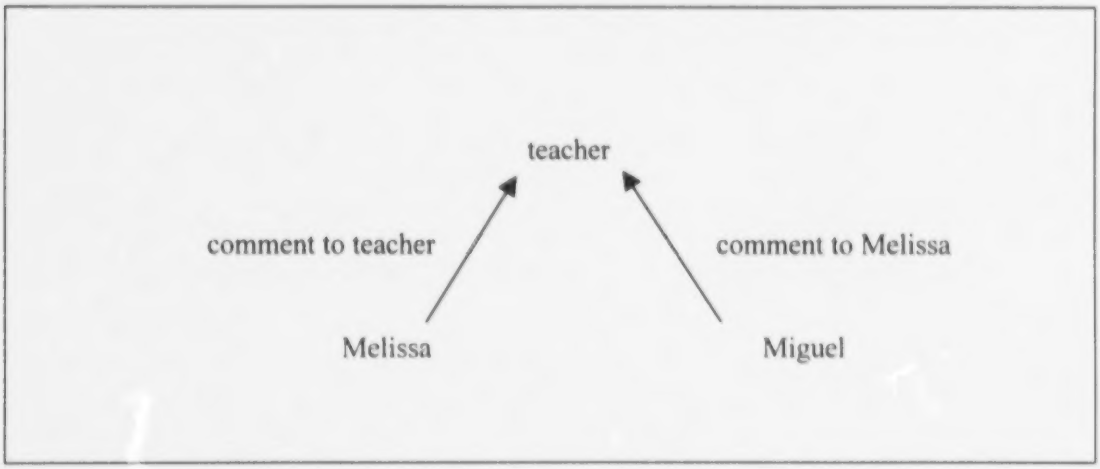
A Thinking Community: Teacher as Sole Recipient

At this point, it is important to look more closely at the subject-matter exchanges in one of Ms. Campbell's class periods from later in the semester to see how an established discourse practice is constructed locally. The class period of focus is from November, and the task for most of the period is to review previously presented material. Throughout the five years of our classroom observations, this type of task was common across subject matter and across teachers. In such a review format for the class period, the teacher moves around the classroom answering student questions as they arise. However, as this excerpt and the later excerpt from the 9th grade science class show, this common lesson format results in several very different classroom discourse practices, which, in turn, result in the establishment of very different environments for subject-matter exchanges, knowledge creation through action, and the creation of thinking communities.

With students not constructed as relevant recipients to classroom discourse early in the semester, as the previous section illustrated, many students are not active participants in classroom activity or in the creation of knowledge later in the semester. The following example is a representative sample of the type of discourse pattern that developed in Ms. Campbell's class.

In this excerpt (15, below) from the November review session, Ms. Campbell is at the overhead projector, filling in the review sheet that students are filling in at their desks. The review is on the atomic particles that make up various elements. During the teacher's presentation, a student, Miguel, begins a subject-matter exchange by asking a question (line 27) that expands on the teacher's presentation: "But is it neon?". The teacher comments on Miguel's question immediately, complimenting him, and reformulating the question. A reformulation of a student answer is a common part of classroom discourse (the third part of the IRE sequence). Lemke (1990) calls these reformulations "selection and modification of student answers" and notes that such reformulations focus on subject-matter exchanges and work to make connections between scientific concepts. What is significant about such reformulations for this paper is the way in which they help to establish a framework for recipiency in the classroom discourse. By reformulating the student's response (either with altered lexicon or a verbatim repetition), the teacher does not leave the floor open for students to respond directly to the student question. After the reformulation, any response to Miguel's comment will be in response to the teacher. While

several students are laughing after the teacher's reformulation, one student, Melissa, at line 31, offers an answer responding to the teacher's reformulation of Miguel's question. But the teacher does not acknowledge Melissa's answer, and instead, asks another question targeting the process of removing an electron (lines 32-33). Melissa responds to that question and then explains her answer at the teacher's request (lines 34-36). The teacher makes an evaluation of the answer (line 38) during which Miguel disputes the solution that Melissa and the teacher have constructed (lines 39 and 42). Here, while Miguel's response is directed to the teacher, his dispute is with the answer given by Melissa. So, while Miguel's comment is about Melissa's answer, it is addressed to the teacher. This is evidence for how the students and teacher have co-constructed a discourse practice in subject-matter exchanges where, even when students are commenting on one another's contributions to the discussion, the comments are addressed to the teacher. In this way, even when students have subject-matter exchanges with the teacher and with one another, the teacher may control this discourse by re-voicing the students' subject-matter exchanges.



Example 15:

23	teacher:	there is one, there is one electron here. (you are) get rid of that one
24		electro:n, then my: electron configuration looks like ne:on.
25	Miguel:	whoa.
26	?MS:	okay.
27	Miguel:	but is it neon?
29	teacher:	but is it- good question. Is it neon.
30	Ss:	heh [heh heh
31	Melissa:	[no:
32	teacher:	[If I-if I ta:ke this, (...) if I ta:ke this, sh::::, and (xx) off
33		this electron, (.) have I changed sodium into neon now?
34	Melissa:	no:::,

35	teacher:	why not.
36	Melissa:	because you still have (electrons).
37	Daniel:	(xxx)
38	teacher:	okay. remember it's the protons that identify the [element.
39	Miguel:	[miss, now the atom is
40		a positive, cha:rge.
41	teacher:	okay. ye::s. good poi:nt.
42	Miguel:	(I thought) you didn't want that.
43	teacher:	[okay. now hang on. (xxxx)

After another question by Miguel (line 48, example 16), the teacher compliments him again, but does not discuss the answer and does not open the question up to the rest of the class. Instead, she tells students to "put it on the back burner" (line 53) and then begins to re-voice another student's question asked earlier (line 54) making herself the recipient, and not Craig, of any discussion by students toward Craig's question.

Example 16:

44		[((bell rings))
45	Edward:	the:re's, the be:ll.
46	?Ss:	heh heh heh heh.
47	?Ss:	(xxxxxx)
48	Miguel:	miss. (.) what if you added, (.) atoms of, chlorine.
49		(8) **[((students talking indiscriminately))**
50	teacher:	[(xxxxxxx)
51	teacher:	but I'm gonna ask that, (...) I'm gonna ask that you be pa:tient. >okay?
52		and,< Miguel's question was really good. (..) okay. I'm gonna ask that
53		you put it on the back burner. >don't forget about it< but just put it on
54		the back burner. (.) okay. (.) Craig's question was e:xcellent. did you
55		hear what he asked.

Although Miguel is persistent in trying to engage the class in a discussion, his line of questioning is held back by the teacher. We acknowledge the privileged status of the teacher in classroom discourse practice, but with Van Lier (1988), we would like to challenge the commonly held notions about teacher control in classroom discourse. While we recognize that it does take extraordinary effort and courage by the students to continue to pursue a line of inquiry when the teacher is explicitly moving away from it, students do have a role in negotiating their place in those discourse practices. Our observations have discovered that responses to student initiations are not always made by the teacher (as McHoul, 1978 has claimed) and that teachers do not always rigidly control the classroom discourse (Sinclair & Brazil, 1982). But while students can and do actively participate in subject-matter interactions, the other students in the

example above do not insist on getting an answer to Miguel's questions and do not insist on offering their comments to one another. In this example, the students do not put forth that effort or have that courage and in this way, they are working to negotiate a classroom discourse practice where the teacher's role is dominant in controlling the topics and re-voicing student subject-matter exchanges.

We have shown how students and teacher negotiate a classroom discourse practice in Ms. Campbell's classroom in which the teacher is, if not the sole recipient, the primary recipient of subject-matter exchanges. On a micro, linguistic level, we have shown how Ms. Campbell's choice of pronouns and idiosyncratic lexical choices worked to distance the teacher from the students in terms of subject-matter expertise. These linguistic choices contributed to the co-construction of the teacher as the subject-matter presenter and expert. Despite a philosophy that emphasized the cooperative nature of scientific enquiry and a classroom structure that would allow that kind of talk amongst students, Ms. Campbell's class did not engage in this kind of thinking community. Instead, we observed an emphasis on independent thinking and dialogue with the teacher as the primary means of learning science. The discourse practices that started from early on in the semester worked to structure the classroom as a place of individual learners and one teacher subject-matter "expert."

Through the recurrence of these practices from early in the semester, we can see how a thinking community for this science class develops in which the teacher has been co-constructed as main recipient of subject-matter exchanges in the classroom. When this type of participation structure is established, the thinking community of the classroom works to have subject-matter information channeled through the teacher/"expert" who frames, re-frames, interprets, and re-voices comments for students. While such a classroom discourse practice may be seen as negative in terms of science education reforms (which are advocating more interactive, student-active discourse practices), the recipient design and subsequent thinking community does reflect similar practices of professional physicists as discussed in Jacoby and Gonzalez (1991). In the practices described there, the role of institutionally recognized "expert"/"leader" of the physics group (the principle investigator) is re-established by the discourse practices in the course of working through problems. The Jacoby and Gonzales analysis shows that expertise is not static, but rotates around the working group. However, the principle investigator is always the primary recipient of the others' talk, no matter who is the expert of the moment. The Jacoby and Gonzales

(1991) article shows that having a single recipient reframe and revoice discussions may well be a scientific discourse practice that students need to recognize and operate within to join scientific communities of practice. The teacher-as-expert discourse practice can and does contribute to the construction of a thinking community.

For the presentation of subject-matter material in a large classroom, the type of classroom discourse practice described in Ms. Campbell's class may have advantages for its efficiency. In a class of 30 students, it is difficult to manage student-student talk effectively while still covering all the scientific concepts required by state and national mandates. In the thinking community described above, we see the teacher taking advantage of her recipiency status in order to offer multiple explanations for differing levels of comprehension on a wide range of topics in a relatively short amount of time.

Co-constructing a Class of Recipients: Early Days

At this point, we are going to shift the focus to another science teacher we had observed during the previous year. The discourse practices that evolved in that classroom, and the thinking communities that resulted from those practices offer an interesting contrast to the practices just described from Ms. Campbell's class.

While analyzing a review task from the end of the first semester (December) in a 9th grade biology class, we noticed quite a different discourse practice for subject-matter exchanges from the type discussed (above) in Ms. Campbell's class. In the December review class, while students were working alone at their desks, they began to engage one another in a series of subject-matter exchanges in service of developing a definition for malaria. What is remarkable about this class period is the way the students take the initiative to find the definition as a group. The students are sitting in the regular, teacher-fronted classroom setup and the teacher gave no instructions to the students to work cooperatively. After seeing such an exchange (reviewed in detail below) we asked: When a teacher does not explicitly assign recipients for student-initiated subject-matter exchanges, who become the recipients?

From the beginning of the semester, the teacher, Ms. Belmontes, impressed upon students the importance of meeting deadlines for submitting work and the importance of working productively in class. She actively worked to have students thinking only about subject-matter

issues at all times during her class. By the end of the first semester, the students and teacher seemed to have co-constructed a classroom discourse practice in which, when students had questions, everyone in the class was designed as a recipient. The following excerpts from the classroom discourse from the first two weeks in the school year show how the teacher, with the students, has worked to co-construct the whole class as recipients for student questions and comments. (Note, especially, the lines marked by arrows.)

Example 17: from the first week in September – a student critiques another student's answer

	teacher:	ok what's another we say we we write the problem in (.) right now in format of a question (.) ok you can write it in your notebook if you wish (.) so that you have a an idea
	Manyvan:	can we also put uh which uh tree is more productive
	teacher:	ok (.) if you ok but you COULD do that
→	Shavonne:	but that ain't the [main point
→	teacher:	[but then you'd have to uh (2.0)
→	Shavonne:	that's not the main point
	teacher:	but but that wasn't the main problem. that is true…

Example 18: first week in September – a student questions another student's answer

	teacher:	if we're going to test we have to have more than one we're going to have to have several and then these are going to have to have the same variables same type of soil ok
	Shavonne:	you can't use two different trees though.
→	Adrianne:	what is she talking about?
	teacher:	did we say two different TREES or two different KINDS of trees?

Example 19: second week in September – teacher asks other students to comment on a student's answer

	teacher:	all right. s:o let's go to the next one. a:h mutation. what is mutation?
	Jocelyn:	°the deforming of a gene°
→	teacher:	is the deforming?
→	Maggie:	oh. a a damaged gene gene or something like that?
→	teacher:	a:h do do you agree?
→	Latoya:	no.
	teacher:	in a way you're right. It's a damaged-

Example 20: second week in September – a student comments on the information supplied by another student

Bert:	I got the rest of it.
teacher:	ok.
Bert:	cystic fibrosis is when your lungs get clogged with mucus from a defective a gene. muscular dystrophy is when your muscles waste away because of of a defective another gene.

→	Shavonne:	[hey I didn't know that.
	teacher:	[huh? Ok then they give you a third question how do how do they plan on uh curing this? Yes?
	Adrianne:	by transferring normal functioning genes into the defective a
	teacher:	yes so they actually have new tools where they can cut out the defective ones and put in the new ones.

These examples show that the teacher holds students accountable to be active participants and recipients in the classroom discourse, quickly socializing them to this kind of talk. We also see students themselves taking the responsibility to understand one another. When such an expectation for recipiency has been established in the class, we can see how students become relevant recipients for subject-matter exchanges such as the student-initiated exchange on malaria discussed below.

Most of the students in Ms. Campbell's 10th grade chemistry class had been students in Ms. Belmontes' 9th grade biology class. Ms. Belmontes' philosophy of education contrasts sharply with that of Ms. Campbell. Ms. Belmontes was very "hands on." She closely monitored students' behavior in her classroom, and this close monitoring strongly affected the way the students interacted with the teacher and their peers. Her approach to classroom discourse especially influenced how the students co-constructed their participation in the classroom discourse. In the following excerpt from an interview with Belmontes, she talks about student talk in the classroom, student resentment toward the teacher for working them so hard, and her peers' comments about the work that students did in her class.

Belmontes:	[I]f you examine their conversations . . . on topics, they they pay attention to detail, they notice things and they discuss issues so that's positive . . . [I]f they could use that and some of the skills, there is a lot of potential.
. . .	
interviewer:	I am curious. What's your sense of why they did well?
Belmontes:	I'm not really sure (laughs). I noticed at first a resentment towards me at the beginning of the year: "Why are you making us do this?"
. . .	They still would do it at the end, but it was different and I would take it different because at the beginning it was like "Why? Why are we doing this? Why are you". . . like I was such a pain, but at the end it was more like "OK, we're gonna do it" and it was a different attitude, too. It was like, "Oh, I'm gonna show you I can do this."
. . .	It was more like a team type of work – well, OK this is Ms. Belmontes' project.
. . .	I had a couple colleagues comment why are they doing your work and not mine? I don't know, oh, don't ask me. (laughs)

interviewer: That's very interesting.

Belmontes: I didn't know and they said, "I think they're afraid of you." But, see, I don't think they're afraid of me 'cause the way they behave in the classroom. I don't think they are . . . afraid of me. They act more like there's a . . . certain respect, but there's a certain rapport at the same time.

interviewer: That's certainly what I've picked up from the twice a week we've been in the class.

Such comments by Ms. Belmontes and the interviewer (an observer of the class for the entire year) show that the teacher worked hard to keep the students actively involved in all aspects of the class – sometimes to the point where students disliked her for it. This involvement of the students in the classroom activity and discourse is reflected in the students' co-construction of themselves as relevant recipients for subject-matter exchanges. This co-constructed recipiency creates the possibility for the development of discourse practices that allow inclusive thinking communities to develop where students work together with the teacher to undertake subject-matter learning. A vivid example of this is presented in the following examples (21-23) from late in the first semester of Ms. Belmotes' 9th grade biology class.

Another Kind of Thinking Community

The earlier examples and discussion show how from early in the semester, students and teacher are co-constructed as recipients of subject matter talk. In the excerpts of focus below, we can see how such recipiency is negotiated on a case-by-case basis. In this classroom, during lessons when students are working on reviews at their seats, they work collaboratively, designing either the teacher, their classmates, or both as recipients for their talk. In the example below, however, Ms. Belmontes has not given explicit instructions to the class how they may organize their classroom discourse. Students were not told that they may or should work collaboratively and must negotiate this type of participation structure locally, with the teacher, for this particular class period.

Students are at their desks working on completing a review sheet for their final exam. Since the opening of the class when the instructions were given to the students, about 10 minutes have passed with the students working quietly at their desks and the teacher circulating among the students, keeping them on task and answering their questions.

Any exchange in Ms. Belmontes' class, even a student-student subject-matter exchange, must be carefully broached to find a place in the discourse since the teacher is quite attentive to all the talk that goes on in the classroom. And one of the striking characteristics of this excerpt is how it starts from relative silence in the classroom to a participation structure of six students and the teacher engaging in a dialogue about the issue.

The following excerpt (21) starts with a student (Jocelyn) making audible a question she is working on. Her neighbor, Vanessa, hears Jocelyn's question and begins a discussion with Jocelyn regarding that particular question ("number two") on the review sheet.

Example 21:

141	Jocelyn:	okay. what is malaria? °malaria is (xxx)°
142	Vanessa:	which-which one is number two. ((to Jocelyn))
143	Jocelyn:	malaria
144	Vanessa:	that's cool. at the beginning of the twentieth century
		((several lines of other students' talk))
150	Jocelyn:	what page. what page is that on
151	Vanessa:	six [(xxx)
153	Jocelyn:	[(why am I not finding it)

Jocelyn and Vanessa start the student-to-student exchange about a question from the review sheet, speaking very quietly to one another. At lines 141-142, Jocelyn's seemingly personal questioning is picked up by Vanessa, showing how peers see themselves as recipients for their peers' subject-matter talk. Their exchange succeeds without reprimand from the teacher and when Jocelyn does not find the information where Vanessa indicated it may be (at line 151, Vanessa tells Jocelyn that the information is on page six), she broadens the exchange to include a third student, Ronald. Jocelyn asks Ronald what he wrote on his review sheet (line 154, example 22).

Example 22:

154	Jocelyn:	what did you write down for malaria? ((asking Ronald))
155	Ronald:	which one? from the essay?
156	Jocelyn:	no this?
157	Ronald:	ah-ah what is malaria?
158	Jocelyn:	I just (write that)
159	Ronald:	(xxx) malaria
160	Jocelyn:	(look) on page six.
161		((Jocelyn laughs))
162	Ronald:	page six. damn. way back there, I didn't know that there
163		was a page six.

There is not a precise point at which we can say that the students and teacher have co-constructed this exchange as largely a student-student discussion. The expanding circle of student participants in discussion shows it being accomplished gradually. And by the time the teacher enters the discussion (line 177, example 23), the subject matter exchange seems to be well enough established as a student-led discussion that the teacher's turns do not begin to dominate the discourse, as often happens in small-group student discussions (Ford, 1999). In the following part of the excerpt, we see the teacher comment on the discussion (line 177) but not disrupt the student-student SME. Also, in line 171, a fourth student (Miguel) enters the discussion.

Example 23:

168	Jocelyn:	it says (disease) of [the century (xxx)
169	Vanessa:	[the century (xxx)
170	Ronald:	where are you?
171	Miguel:	malaria.
172	Jocelyn:	then why does it say (xxx)
173	Ronald:	tuberculosis ya tuberculenosis tuberculosis,
174		pneumonia
175	Jocelyn:	°and flu°?
176	Ronald:	and(.)the flu? The flu? (.) The flu actually kills people?
177	teacher:	ya the flu kills people
178	Ronald:	holy?
...		
192	teacher:	the first one they viewed most of it as malaria.
193	Ronald:	ya there was malaria in the early century, wasn't it. See I
194		was right. I remember.
195	Miguel:	I remember too. that why the questions asks if you have
196		ever had malaria?
197	Ronald:	ya that's why. (there are two reasons). its malaria
198		wouldn't kill someone. it's malaria. it doesn't feel so bad
199	Jocleyn:	actually its does

So, while the teacher does eventually enter and contribute to the discussion, the exchange remains essentially, a student-student subject-matter exchange in which students treat one another as well as the teacher, as relevant recipients for their questions and answers.

The data from the classroom discourse and interviews with students and teacher from the 9th grade biology class show that work was done early in the semester to establish students as full recipients of subject-matter exchanges. The groundwork was laid at that time for the development of a classroom discourse practice that allowed the student discussion of malaria later in the semester (a student-student subject-matter exchange with the teacher as a non-

dominant participant) to happen. It is both during and as a result of such classroom discourse practices that thinking communities of students and teacher are established. And it is within these thinking communities that students feel secure contributing their knowledge and experience to subject matter discussions and teachers feel secure allowing student-led discussions to occur throughout the classroom.

CONCLUSIONS

After reviewing the discourse in two high school science classrooms in some detail, two different science classrooms with experienced teachers, we have observed that learning and achievement is accomplished by the construction of thinking communities through quite different discourse practices. While the focus of this study was not, primarily, a longitudinal comparison, because the majority of Ms. Belmontes' 9th grade biology class went into Ms. Campbell's 10th grade chemistry class, we will note some issues relevant to the co-construction of classroom discourse practices across the two classrooms.

The students came into Ms. Campbell's class out of their 9th grade science class in which the teacher was very direct about telling students how to be involved in class. Ms. Belmontes made her expectations very clear that the classroom discourse was to only be about subject-matter issues. She gave the students no opportunity for self-discipline or self-motivation and confronted what she saw as any breech of her classroom protocol swiftly and sternly. In part, through this controlling type of classroom leadership, students were always held accountable as recipients of the teacher's and their peers' subject matter exchanges and a more participatory classroom discourse practice developed.

After one year of classroom observation and an extensive review of the video recordings of Ms. Campbell's class, we saw that the students coming from Ms. Belmontes' class, where they were constantly held accountable for being on task, were challenged by the expectations for the discourse practices of their 10th grade chemistry teacher. While in their 9th grade biology class, the students and teacher co-constructed a dominant discourse practice in which students were responsible as much for body control as they were responsible for subject-matter (biology) control, in their 10th grade chemistry class, the students and teacher negotiated a quite different

discourse practice in which control over subject-matter matter was much more important to the teacher and took precedence over talk about behavior.

The socialization process that the students had come to recognize from Ms. Belmontes' class involved issues of control of both the body and the mind in the classroom. While the students were, of course, held responsible and accountable for subject-matter learning, they were also held responsible and accountable for displaying a particular kind of comportment within the classroom, in the socialization of what Bourdieu has called habitus' (1991). In Ms. Belmontes' classroom, subject-matter work was not done without the complete cooperation of the class through the appropriate classroom comportment. When engaging in subject-matter exchanges, students were expected to sit up straight, to speak loudly and clearly, and to speak in the standard dialect of English. Subject-matter discourse was very much embedded in a larger, sometimes non-verbal "discourse" of classroom comportment. The thinking community that evolved in Ms. Belmontes' class reflects these multiple sources and purposes for the classroom discourse practices.

When students began work in Ms. Campbell's class, they found that while they were held responsible for control of both their comportment and their subject-matter knowledge, they were not held directly accountable for the level of comportment that was expected of them in their 9th grade science class. That is, while the teacher expected students to master a high level of the subject-matter material and to be respectful to her and to one another, it was usually only for a lack of subject-matter mastery that students suffered consequences. The teacher noted an absence of appropriate comportment, but chose not to make it a focus of classroom discussion or evaluation. The subject-matter exchanges were not always embedded within the "discourse" of classroom comportment because, in part, the teacher did not work to implement this embedding. She expected students to have internalized the "right" or "appropriate" ways to behave in class.

In 9th grade, the students and teacher developed a thinking community in which the teacher expected, requested, and enforced two aspects of discourse from them. Moving to 10th grade, the rules of interaction for the development of a thinking community changed. In Ms. Campbell's class, the largely intact block of students from Ms. Belmontes' class had to re-negotiate their roles in the classroom discourse practices, which led to the development of a different kind of thinking community. This re-negotiation occurred, in part, because of the different subject-matter they became a part of, but more so, due to the different ways in which their 10th grade science

teacher saw her role as a leader of the classroom discourse. This re-negotiation resulted in the creation of a different type of classroom discourse in 10th grade than what was customary for students in their 9th grade science class, which led, in turn, to the establishment of a new type of thinking community in which students learned science. This re-negotiation of the roles in classroom discourse practices is at the heart of the students' socialization to and through school, what students must accomplish every day in school.

ENDNOTES

[1] All names in this report are pseudonyms, used in an effort to protect the confidentiality of the participants in the study. Where possible, names have been chosen which reflect the gender and ethnic background of the people we are talking about.

[2] The racial and ethnic categories in this report conform to those used by the Center City School District and are not necessarily the categories we would choose to use.

The following transcription conventions are used in this paper. They are those commonly used in converation analysis and have been adapted from those conventions outlined in Atkinson and Heritage (1984) and Du Bois, et. al. (1993).

[	overlapping talk
=	latched utterances
(1)	timed silence in seconds
(.)	micro pause
(....)	longer pause, not timed
tra:nscribe	stretched sound
tra::nscribe	longer stretched sound
transcribe.	falling final intonation
transcribe,	falling but continuing intonation
transcribe?	rising final intonation
transcribe-	abrupt cutoff
transcribe	emphasis
TRANSCRIBE	louder talk
°transcribe°	softer talk
.hhh	inbreath
hhh.	outbreath
>transcribe<	faster talk
(transcribe)/(xxx)	transcriber's uncertainty
((cough))	transcriber's note
((transcribe))	simultaneous conversation, beginning and end
(15:00)	Indicate five-minute intervals at the left margin

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